In an attack of Jacksonian epilepsy there is first a tonic followed by a number of clonic spasms. It is known that the initial discharge takes place from the cortex, and therefore the tonic spasm is of cortical origin, but the question still remained as to the origin of the clonic spasms. These might arise either by separate discharges from the cortex, or by a rhythmical discharge of the spinal centres consequent upon a single stimulus from the cortex. Relying on the fact that each separate impulse as it passes along a nerve gives rise to a negative variation of the resting nerve current, then, if it were possible to tap the pyramidal tract above the spinal centre while the cortex was being stimulated, and examine the negative variations, it would be seen whether a series of impulses were coming from the cortex at the proper rate to account for the clonic muscular contractions. In the first place, the authors succeeded in so operating on the spinal cord in the monkey that it could be kept alive and suitable for study for nearly half an hour. With non-polarizable electrodes, they then led off the resting nerve current from the cut and longitudinal surfaces of the pyramidal tract to a capillary electrometer—a capillary tube containing a column of mercury, the height of which varies with slight variations in the electrical tension. So delicate is this instrument that it responds quite satisfactorily to variation in the nerve current by a change in the position of the mercury in the tube. The amount of this change is magnified by viewing it through a microscope. In these experiments the oscillations of the mercury were recorded photographically.

Stimulation of the cortex in the leg area gave rise to a prolonged negative variation corresponding to the tonic period; then, on the removal of the electrodes from the cortex, there followed a series of variations corresponding perfectly to the clonic period of the muscular disturbance. The origin of the clonic contractions is therefore cortical. That the result is not due to a diffused disturbance in the cord is shown by the fact that if the electrometer be undisturbed and the arm centre in the cortex be stimulated, there is no evidence of any electrical variation. An attempt to tap the motor nerve roots and test the negative variations there led to no results, the disturbance being too slight to affect the electrometer. The results in this case are highly interesting, but hardly less interesting are the several very refined methods of operation and observation by which these results were obtained.

*A Comparison of the Latency Periods of the Ocular Muscles on Excitation of the Frontal and Occipito-temporal Regions of the Brain.* E. A. Schaefer. Received February 13, 1888. Proc. Roy. Soc. Vol. 43.

The very condensed statement which the author makes of these experiments cannot be further abstracted without some important omissions. We give, however, his main points. The conjugate deviation of the eyes to the opposite side is produced by the excitation of entirely different regions of the cerebral cortex. The parts which, when electrically excited, produce this movement, are: 1, an area included in the motor or psychomotor zone of the authors; 2, the sup. temporal gyrus; 3, the upper end of the middle temporal gyrus; 4, the post. limb of the angular gyrus; 5, the whole cortex of the occipital lobe, including its mesial and under surfaces; 6, the quadrate lobule. Of these parts, the frontal area is distinguished

by the fact that its excision causes paralysis of the movement. From this fact Ferrier concluded that in the case of the frontal area the excitation was direct, while in all the other cases it was indirect, *i. e.* through subjective sensations. To test this, S. examined the latent period of stimulation of the ocular muscles when excited through the various regions named, and found that it was some hundredths of a second less in the case of the frontal area than for any of the others, thus indicating that in the case of the latter the impulses must pass through at least one more nerve centre than in the case of the former. It was most natural to infer that this other nerve centre would be the frontal area. But that this is not so is indicated by the fact that complete excision of the frontal area on both sides does not abolish the reaction when caused by stimulation of the other portions of the cortex. What the other centre may be is therefore still left doubtful. The work was done on monkeys.

*On Electrical Excitation of the Occipital Lobe and Adjacent Parts of the Monkey's Brain.* E. A. SCHÄFER. Rec'd Feb. 13, 1888. Proc. Roy. Soc. Vol. 43.

By stimulating the parts of the cortex named, S. has found that not only were movements of the eyes obtained, but that the direction of these movements bore a relation to the portion of the area stimulated. This is the reverse of Ferrier's results, who got no movement from the occipital cortex, and a refinement of the results of Luciani and Tamburini, who obtained a simple conjugate deviation of the eyes. The regions from which movement of the eyes can be gotten by stimulation of the cortex in and about the occipital lobe are named in the preceding abstract. This area is divided by S., according to his results, into three zones—an upper, middle, and lower, enumerated from above downwards. The parts about the parieto-occipital fiss. form the upper; the inferior zone comprises the whole inferior surface of the lobe and the lowermost parts of the convex and mesial surfaces; while the middle zone lies between these two extremes. An excitation of the superior zone causes movement of the eyes downwards; of the middle zone, a lateral deviation, and of the inferior zone, a movement upwards. It is therefore inferred that the superior zone is connected with the upper lateral portion of the corresponding half of each retina, the middle zone with the middle portion, and the lower zone with the lower portion. S. concludes: "If we imagine the visual areas of the two cerebral hemispheres to be united in the middle line, we may conceive each retina as projected in its normal position over the united area. It will then at once appear that the upper and lower parts of both retinas will fall upon the corresponding parts of the united area, that the outer part of the left retina and the inner part of the right will fall on the outer portion of the left side of the united area, and *vice versa*, and that a vertical line bisecting each retina will fall along the line of union of the two cerebral visual areas. The parts concerned with direct or central vision will therefore correspond with a part of the mesial surface, and each pair of 'identical points' of the retinas will correspond with one and the same spot of the cerebral surface."